

and the people coming in at one end would pass entirely through the 10 exhibition coaches. Government attendants and demonstrators were stationed beside their exhibits and explained them as the people passed through the train.

The following departments had exhibits: Agriculture, Interior, Navy, War, Treasury, Interstate Commerce Commission, and American Red Cross. The Department of Agriculture was represented by three of its branches—Weather Bureau, Forest Service, and Bureau of Animal Industry—each having one-third of a 70-foot coach.

The Weather Bureau exhibit, shown in figure 1 opposite, consisted of charts and pictures, storm-warning lanterns, a model of a house showing a system of lightning conductors, a glass weather map, and most of the meteorological instruments that would permit of being carried on a train.¹ All were selected with a view of showing, in the small space available, the work of the Weather Bureau in observing and recording weather conditions and forecasting the weather, including frost, cold waves, storms, and floods. A striking chart was one that contrasted the number of lives lost during a hurricane of 1893—before the organization of the Weather Bureau's West Indian service—with the number lost during a storm in 1915. The model house with lightning rods attracted considerable attention and from a practical educational standpoint was second to no other exhibit on the train. The method of forecasting was shown by the aid of the glass weather map, which was drawn every day, and most people expressed themselves as being much pleased with the opportunity of learning the basic principles of forecasting.

The explanation of the instruments was made easy by having them so placed that all could be seen at once. The triple register was in actual operation; an electric light actuated the sunshine recorder, the cups of the anemometer were rotated by an electric fan, a sprinkling can was the source of many showers, and the wind vane could record three different directions. Both tipping bucket and ordinary raingages were exhibited in operation and attracted more attention than any other of the Weather Bureau instruments.

The train was operated by the Baltimore & Ohio Railroad for two months, and one month each by the Missouri, Kansas & Texas Railway and the Union Pacific Railroad companies. In all, it traveled 10,000 miles, was exhibited in 87 cities of 16 different States. The total attendance was 534,000, giving an average daily attendance of 5,180 for the four months that it was on the road.

While the large number of people attending precluded their seeing the exhibits as thoroughly as was desired, yet the trip as a whole was a success.

GRAPHICAL METHOD OF SHOWING THE DAILY WEATHER.²

E. T. QUAYLE, Assistant.

[Commonwealth Bureau of Meteorology, Melbourne, Australia.]

[Reprinted from *Geographical Review*, New York, Sept., 1916, 2:233.]

A simple method of keeping a graphic record of the daily weather has many advantages over the usual written description. Mr. E. T. Quayle, assistant in the Commonwealth Bureau of Meteorology of Australia, has recently described a simple scheme for a graphic record which he has used satisfactorily for over twenty-five years. The record deals chiefly with cloud types and their amounts, movements, and changes, but includes also

winds, rain, and electrical and other phenomena. The time (hour of the day) is shown along a horizontal line, and the cloud levels are indicated vertically. The cloud forms are represented as seen in section, or as they would appear on the horizon. The level to which the cloud belongs is indicated by the height of its position on the vertical scale of the diagram. The amount of cloud and its duration are partially suggested by the way the stratum is broken or by the addition of a figure to show a numerical estimate. The rate of movement may be shown by different amounts of feathering on arrows which show the direction of movement. Wind directions are indicated by arrows at the bottom of the diagram. Rain, lightning, etc., are suggested by conventional symbols or by sketches. Short supplementary notes may be added when necessary. The illustrations of this method of keeping a graphic weather record, given in Mr. Quayle's report, show the value of the scheme in presenting at a glance a vivid and interesting picture of each day's weather.—*R. DeC. Ward.*

TOWER CLOUD AT SAN JUAN, P. R.

By F. E. HARTWELL, Meteorologist.

[Dated: Weather Bureau Office, San Juan, P. R., Aug. 16, 1916.]

About half an hour before sunset August 15, 1916, at San Juan, P. R., the sky being otherwise absolutely clear, a large flat-topped cumulus cloud was observed silhouetted against the western sky. A perfectly smooth band of false cirrus lay across the top and extended over the edge of the dark cumulus, the formation being such that it seemed to indicate the foreshortening of a wide curve in the overhanging edge of the band, which was luminous from the setting sun behind it.

From this stage the cumulus rapidly assumed the formation of [a wide cumulus chimney] with a cap of the false cirrus arranged in four distinct bands, thin enough to show their circular form; the top and broadest band was luminous, the other three narrow ones were in the shade of the dense cloud. No motion could be detected in these bands, so smooth was their texture, but it would seem that they could have been held in such a form only by a circular motion. These bands persisted with very little change for 20 minutes or more, the upper disk or band disappearing first and then what appeared to be the edges of two similar disks appeared a little below the bases of the original narrow disks.

The height of the cloud at its maximum development with its triple crown was about 30°; there were frequent lightnings through the middle of the cloud column, but the distance was so great that no thunder was heard.

The above note and description, with its unpublished sketches, relates to a cloud form rarely if ever reported from the Western Hemisphere. Similar and related forms have been figured and described in the *Meteorologische Zeitschrift*, notably in its issue for January, 1896 (13: 14-15 with Tafeln I, II).

The present form differs in some details, however. There are no radial fringes suggestive of matter being hurled out from within the bands (cf. sketch in *Met. Ztschr.*, Nov., 1901, 18: 527); neither is there a strongly developed overhang to the bands; the sketch shows but a slight leaning outward.

Mr. Hartwell does not mention associated hail falls, and we must wait for later reports before it can be asserted that in this case the cloud is properly termed a Hagelturmwolke (hail-tower-cloud), as was the one described by Streit in the *Meteorologische Zeitschrift*.—O. A., jr.

¹The objects of this exhibit were illustrated in more detail in the plates facing pp. 452-3, of the REVIEW for September, 1916.

²Quayle, E. T. A graphical method of showing the daily weather, especially cloud types. Melbourne, 1916. (Commonwealth Bureau of Meteorology, Bulletin 12.)



FIG. 1.—View of U. S. Weather Bureau exhibits on the "Safety-First Train," 1916.